VENICE 2026

11th INTERNATIONAL SYMPOSIUM ON
ENERGY FROM BIOMASS & WASTE
23-25 November 2026, Venice, Italy

SYMPOSIUM PROGRAMME

(Updated on 13.10.2026)



Programme at a glance

Thermal treatment | Biological treatment | Biofuels | Various | Energy Recovery & Circular Economy | Focus Session

Monday, 23 November 2026

09:00 - 10:15	**OPENING SESSION** Chair: Raffaello Cossu, University of Padova (IT)		
10:45 - 12:00	**FOCUS SESSION I**		
12:15 - 13:30	SESSION A01 **Combustion, Emissions and Process Efficiency**	SESSION B01 **Pretreatments and Feedstock Selection**	SESSION C01 **Life Cycle Thinking and Assessment**
13:30 - 15:00	*Lunch break*		
15:00 - 16:15	SESSION A02 **Optimization of Incineration Processes**	SESSION B02 **Modelling, Optimisation and Systems Analysis**	SESSION C02 **Workshop - Sustainable Electronics: Reuse, Recycling, and LCA I** Chair: K. Owusu-Sekyere (DE)
16:45 - 18:00	SESSION A03 **Advanced Gasification and Syngas Valorisation**	SESSION B03 **Anaerobic Processes: Efficiency and Optimization**	SESSION C03 **Workshop - Sustainable Electronics: Reuse, Recycling, and LCA II** Chair: K. Owusu-Sekyere (DE)
18:30 - 20:00	**SOCIAL EVENT: Welcome Reception & Wine Tasting** *Networking · Italian wines · Light buffet*		

Tuesday, 24 November 2026

09:00 - 10:15	SESSION A04 **Pyrolysis of Plastics and Composites**	SESSION B04 **Specific Biomass Management**	SESSION C04 **Workshop - Carbon, Nutrient, and Energy Recovery Pathways I** Chair: A. Pollex (DE)
10:45 - 12:00	SESSION A05 **Environmental Challenges of Waste-to-Energy**	SESSION B05 **Hydrogen Production and Valorisation**	SESSION C05 **Workshop - Carbon, Nutrient, and Energy Recovery Pathways II** Chair: A. Pollex (DE)
12:15 - 13:30	SESSION A06 **Biomass Thermal Conversion and Smouldering**	SESSION B06 **Perspectives of Biogas Utilisation**	SESSION C06 **Sustainable Aviation Fuels (SAFs)**
13:30 - 15:00	*Lunch break*		
15:00 - 16:15	SESSION A07 **Biofuels and Bioproducts Conversion Technologies**	SESSION B07 **Enhanced Energy Recovery from Biological Processes**	SESSION C07 **Workshop - IWWG Thermal Treatments Task Group Sandpit I** Chair: L. Lombardi (IT)
16:45 - 18:00	SESSION A08 **Pathways and Perspectives for Biofuels and Bioproducts**	SESSION B08 **Education and Public Awareness in Waste-to-Energy**	SESSION C08 **Workshop - IWWG Thermal Treatments Task Group Sandpit II** Chair: L. Lombardi (IT)
21:30 - 00:00	**SOCIAL EVENT: Karaoke Sing-Along Night** *Music · Laughter · Fun*		

Wednesday, 25 November 2026

09:00 - 10:15	SESSION A09 **Advanced Thermal Waste Valorisation**	SESSION B09 **Specific Circular Economy Streams**	SESSION C09 **Workshop - IEA Bioenergy Task 33: Biofuels and Biochemicals I** Chair: J. Lundgren (SE)
10:45 - 12:00	SESSION A10 **Hydrothermal Processes**	SESSION B10 **Circular Valorisation of Industrial Waste Streams**	SESSION C10 **Workshop - IEA Bioenergy Task 33: Biofuels and Biochemicals II** Chair: J. Hrbek (AT)
12:15 - 13:30	SESSION A11 **Biochar Production and Use**	SESSION B11 **Italian Session - Rifiuti e Salute: Presentazione Libro** Chairs: R. Cossu, M. Ferrante	SESSION C11 **National Case Studies**
13:30 - 15:00	*Lunch break*		
15:00 - 16:15	SESSION A12 **Carbon Capture and Utilisation**	SESSION B12 **Workshop - PFAS in Thermal Treatment Systems: Challenges and Future Directions** Chair: F. Khodaparastan (UK)	
16:45 - 18:00	**FOCUS SESSION II**		
18:00 - 18:30	**CLOSING SESSION** Chair: Raffaello Cossu, University of Padova (IT)		
20:00 - 00:00	**SOCIAL EVENT: Casanova Venetian Gala** *Historic Casino Experience · Dinner · Music & Dancing*		

Poster Session - From 23 to 25 November 2026

09:00 - 18:30	SESSION PP **POSTER PRESENTATIONS** Available in digital format at all times throughout the conference.

SESSION A01 / / 23rd November 2026 12:15 -13:30
COMBUSTION, EMISSIONS AND PROCESS EFFICIENCY
Chair / *Presidente*: TBD

***D. Panepinto**, M. Zanetti, P. Urso, V. Tedesco (IT)*
Energy recovery, emission mitigation and resource efficiency in the expansion of a waste-to-energy facility

***T. Turzynski**, S. Polesek-Karczewska, P. Hercel, P. Baginski, A. Andrearczyk, D. Kardas (PL)*
Development and thermodynamic optimization of a small-scale regenerative air Brayton cycle fueled by green methanol

***M. Zanetti**, G. Campo, D. Panepinto, M. Ravina, B. Ruffino, G. Zanzi (IT)*
PFAS management in municipal sewage sludge: environmental monitoring and full-scale assessment of thermal oxidation in a fluidized bed furnace

***S. Umegaki**, Y. Kimoto, H. Harada, M. Takaoka (JP)*
Effects of CO2 concentration in municipal solid waste incineration on high-temperature corrosion of boiler heat transfer tubes

***C. Dettori**, G. Tilley (IT)*
Boosting efficiency with antifouling treatment at WtE plants

SESSION A02 / / 23rd November 2026 15:00 -16:15
OPTIMIZATION OF INCINERATION PROCESSES
Chair / *Presidente*: TDB

***A. Gyorfi**, A. Dolgosné Kovács, B.L. Alpek, Cs. Leitol (HU)*
Effects of particle size fractionation on the main quality characteristics of RDF/SRF

***F. Xu**, L. Yin, D. Chen (CN)*
Co-incineration of industrial organic waste in MSW incinerators: combustion performance analysis and dynamic furnace temperature prediction

***M. Qiu**, D. Chen (CN)*
Performance and iron transformation of Fe-MgO-biochar catalyst in MSW volatile steam reforming: a laboratory-scale comparative study between fixed-bed and fluidized-bed reactors

***K. Stark**, E. Peters, M. Schnell, P. Quicker (DE)*
Decentralised sewage sludge incineration in a double whirl twin stage incinerator: pilot-scale demonstration, energy integration and resource recovery potential

SESSION A03 / / 23rd November 2026 16:45 -18:00
ADVANCED GASIFICATION AND SYNGAS VALORISATION
Chair / *Presidente*: TBD

C. Cord'Homme *(FR)*
Alternative thermal treatment for municipal solid waste: waste-to-energy or waste-to-molecules experience!

L. Lombardi, ***C. Boccia****, A. Maragkaki, E. Maragkaki, G. Daskalakis, T. Kamperidis, R. Muñoz, M.R. Rodero, A. Lazari, S. Saxioni, K. Karakitsou, E. Georgakopoulou, G. Polychroniou, D. Tamvakis, V. Lolou, A. Papamavrou, T. Lolos, C. Tsompanidis, T. Manios (IT)*
Integrated gasification and biological biomethanation for enhanced carbon recovery from organic waste: the LIFE-W2B concept

M. Chiocchini*, S. Piazzi, F. Patuzzi, M. Baratieri (IT)*
A review on hydrochar gasification for the valorisation of waste biomass feedstocks

C. Masala*, D. Fenu, G. Calì (IT)*
Waste-to-hydrogen from non-recyclable plastic waste via gasification: conceptual scale-up and techno-economic assessment

N. Cerone, ***F. Zimbardi****, L. Contuzzi, G. Zito, U. Calice, C. Florio, G. Santilli, M. Carnevale, C. Ragone, V. Valerio, A. Villone (IT)*
Valorisation of lignocellulosic waste via pilot-scale two-stage catalytic tar cracking for clean syngas production

F. Parrillo*, F. Ardolino, G. Calì, A. Pettinau, C. Masala, U. Arena (IT)*
Oxygen–steam gasification for Waste-to-X syngas production in a pilot-scale fluidized bed reactor with integrated catalytic hot syngas cleaning

SESSION A04 / / 24th November 2026 09:00 -10:15
PYROLYSIS OF PLASTICS AND COMPOSITES
Chair / *Presidente*: TBD

***M. Zhang**, S. Liu, R. Li, Z. Hu, X. Wang (CN)*
Continuous rotary kiln pyrolysis of retired wind turbine blades: temperature effects on product characteristics and recycled glass fiber quality

***S. Chen**, R. Feng, Y. Hu, Y. Feng (CN)*
Pyrolysis valorization of end-of-life wind turbine blades in China: recycling facility planning and pilot-scale rotary kiln assessment

***M. Zhang**, R. Li, S. Liu, R. Ruan, X. Wang (CN)*
Pyrolysis of plastic waste and its co-pyrolysis with cotton fabric: temperature dependent product evolution and safety implications for deflagration control

***D. Sorino**, L. Bartolucci, S. Cordiner, F. Lombardi (IT)*
Universal differential equations for mixed plastic pyrolysis modeling

SESSION A05 / / 24th November 2026 10:45 -12:00
ENVIRONMENTAL CHALLENGES OF WASTE-TO-ENERGY
Chair / *Presidente*: TBD

***T. Shishida**, A. Yonezawa, R. Zhang, H. Harada, M. Takaoka (JP)*
Effect of CO2-rich atmosphere on formation of dioxins under O2/CO2 combustion of municipal solid waste

***S. Andersson** (SE)*
WtE fly ash detoxification and zinc recovery

*I. Verginelli, **G. Costa**, L. Acampora, A. Bruni, S. Scotti, S. Malvezzi, C. Mensi (IT)*
Analyzing the environmental compatibility of the use of products from the advanced treatment of APC residues from waste to energy plants through a risk-based procedure

***R. Esposito**, I. Dameno, F. De Antoni, R. Ripamonti (IT)*
Evolution of emission performance and emerging operational challenges in the implementation of the BAT conclusions for waste incineration in Lombardy

SESSION A06 / / 24th November 2026 12:15 -13:30
BIOMASS THERMAL CONVERSION AND SMOULDERING
Chair / *Presidente*: TBD

***T.L. Rashwan**, F. Khodaparastan, P. Renforth, C. Switzer, J.L. Torero, K.J. Dobson (GB)*
Exploring smouldering-based systems for carbon-negative waste treatment

***F. Khodaparastan**, J. Bowen, A. Fraser-McDonald, C. Switzer, J.L. Torero, L. Kinsman, M.A.B. Zanoni, T.L. Rashwan (GB)*
Oxygen dynamics in the smouldering reaction zone: experimental measurements and analytical modelling

***V. Gollnisch**, E. Pienihäkkinen, M. Hechmi Aissaoui, T. Ohra-aho, J. Sirviö, T. Khazraie, L. Sandstrom, A. Dufour (FR)*
Fast pyrolysis of biomasses in a microfluidized bed : effect of biomass pretreatments on bio-oil quality

***R. Li**, M. Zhang, Y. Yang, K. Gao, Z. Hu, G. Dai, X. Wang (CN)*
Comparative evaluation of torrefaction temperatures for different biomass: fuel upgrading and grinding characteristics

***J. Kluska**, K. Matej-Lukowicz, N. Nawrot, J.D. da Silva Fonseca, A. Szymkiewicz, E. Wojciechowska (PL)*
Chicken manure carbonization – Energy balance and sorption characteristic of biochar

SESSION A07 / / 24th November 2026 15:00 -16:15
BIOFUELS AND BIOPRODUCTS CONVERSION TECHNOLOGIES
Chair / *Presidente*: TBD

B. Ndaba-Vatsha *(ZA)*
Nano-assisted pretreatment of biomass for bioethanol production

D. Behera, J. Shaji, S. Lekshmi, D. Shee, ***S. Banerjee****, P. Chatterjee (IN)*
Modified in-situ transesterification of microalgae for engineered alkane production: decarboxylation-driven process-controlled alkane production

S.M. Sadrameli*, T. Ramezani (OM)*
Production of renewable naphtha from catalytic cracking of linseed oil methyl esters (LME)

L. Christwinarso, ***W. De Jong*** *(NL)*
Power-to-X: a techno-economic analysis of commercial bio-oil gasification and electrolytic hydrogen into light olefins in the Netherlands

SESSION A08 / / 24th November 2026 16:45 -18:00
PATHWAYS AND PERSPECTIVES FOR BIOFUELS AND BIOPRODUCTS
Chair / *Presidente*: TBD

***A. Giuliano**, P. Polverino, N. Pierro, H. Sami Ur Rehman, A. Ricca, P. Garzone, M.T. Petrone, I. De Bari (IT)*
Comparing liquid biofuels and developing a decision-support tool for sustainable mobility

*J. Ding, Y. Xin, X. Liu, **L. Sun**, H. Zhong (US)*
Food–energy trade-offs in vegetable oil systems: waste reduction and land-sparing pathways for climate-resilient supply

***F. Zúñiga**, M. Loaiza, Y. Lenis, E. Ariza, J. Calderón (CO)*
Hybridization potential of alternative energy sources in Colombia: biofuel production coupled with solar thermal energy

***A. Kaminsky**, A. Golberg, M. Gozin, M. Gruntman, V. Blass, T. Hatuka, I. Zucker, H.M. Steindel, Y. Anker, F. Nakonechny, M. Nisnevitch, H. Cohen, M. Einat, B. Lew, Y. Knop, A. Abramovich, T. Zidki, G. Pinhasi, A. Gross, R. Palatnik, M. Lishner, L. Friedman (IL)*
FUTUREWISE – Fueling the future: Waste-to-Energy technology and sustainability life cycle assessment

***B.A. Simmons** (US)*
Conversion of mixed waste feedstocks in the North San Joaquin Valley into advanced biofuels and bioproducts

SESSION A09 / / 25th November 2026 09:00 -10:15
ADVANCED THERMAL WASTE VALORISATION
Chair / *Presidente*: TBD

***L. Lombardi**, C. Boccia (IT)*
Solar drying as an enabling technology for energy-positive sewage sludge pyrolysis

***N. Labaky**, A. Dahdouh, C. El Irani, V. Gollnisch, M. Eternot, L. Vilcocq, P. Arnoux, A. Dufour, Y. Le Brech (FR)*
From emissions to resources: temperature optimization for CO2-based lignin recovery from kraft black liquor and subsequent valorization via pyrolysis

***H. Liu**, Y. Feng, D. Chen, J. Han, J. Gu, H. Yuan (CN)*
Pretreatment-regulated carbothermal reduction and water leaching for selective lithium recovery from spent lithium-ion batteries

***Y. Qiu**, A. Zhang, Y. Feng, D. Chen (CN)*
Tuning waste-tire-derived carbon anodes for sodium-ion batteries by CO2/N2 pyrolysis atmosphere

***M. Li**, D. Chen, S. Bian (CN)*
Biochar coupled Ni–Fe/MgAl2O4 composites for steam reforming of MSW volatiles: a comparison with the biochar free catalyst

SESSION A10 / / 25th November 2026 10:45 -12:00
HYDROTHERMAL PROCESSES
Chair / *Presidente*: TBD

A. Di Lisi*, F. Patuzzi, S. Piazzi, M. Baratieri (IT)*
Pretreatment of feedstock to enhance hydrothermal liquefaction conversion process: a review

Y. Ryckmans, E. Bustillo, ***J. Van den Auweele*** *(BE)*
Industrial hydrothermal carbonization of heterogeneous refuse compost: lessons learned from industrial test

SESSION A11 / / 25th November 2026 12:15 -13:30
BIOCHAR PRODUCTION AND USE
Chair / *Presidente*: TBD

***N. Cerone**, F. Zimbardi, L. Contuzzi, G. Zito, C. Florio, U. Calice (IT)*
Environmental impacts and climate benefits of energy-integrated biochar systems from agricultural residues

***U. Schmieder**, A. Pollex, S. Bothe (DE)*
Turning agricultural residues into certified carbon sinks: operational implementation of a decentralized biochar system in Ethiopia

***R. Visser**, N. Vonk , J. Visser (NL)*
Carbon-neutral concrete: biochar as carbon storage in products

*J. Park, **S.-J. Kim** (KR)*
Recovery of valuable metals from stainless steelmaking dust using kenaf biochar as a low-carbon reducing agent

SESSION A12 / / 25th November 2026 15:00 -16:15
CARBON CAPTURE AND UTILISATION
Chair / *Presidente*: TBD

M. Schranzer *(NL)*
Security of supply and decarbonisation through bioenergy: CHP contracting and CO? utilisation in practice

D. Dong*, G. Shin, S. Kim, Z. Tan, J. W. Lee (KR)*
Evaluation of ionic liquid potential for selective absorption of carbon dioxide from biogas

A. Masi*, G. Costa, F. Lombardi, N. Nmiri, L.C. Pasquier, I. Tebiche (IT)*
Analysis of the products of an amine-based indirect carbonation treatment of steel slag aimed at residue valorisation and CO2 storage

SESSION B01 / / 23rd November 2026 12:15 -13:30
PRETREATMENTS AND FEEDSTOCK SELECTION
Chair / *Presidente*: TBD

***A. Fahlén Hammar**, L. Andreas, J. Kumpiene (SE)*
Choosing the right blend: multi-objective optimization of co-digestion

***S. Hirakawa**, Y. Kaizu, K. Furuhashi (JP)*
Stabilizing high-nitrogen anaerobic digestion of chicken manure by pH control: implications for fertilizer substitution and transport burden

*A. Omanakuttan, K. Benyounis, **J. Stokes** (IE)*
Pretreatment effects on the anaerobic digestion of grass for biogas production

***Md.T. Islam**, A. Huda, S. Ahmed (BD)*
From waste to cooking fuel: biogas recovery from faecal sludge treatment systems in Rohingya Refugee Camps, Bangladesh

SESSION B02 / / 23rd November 2026 15:00 -16:15
MODELLING, OPTIMISATION AND SYSTEMS ANALYSIS
Chair / *Presidente*: TBD

***Y. Ge**, J. Tao, Z. Wang, L. Mu, W. Guo, Y. Shi, Z. Cheng, B. Yan, H. Su, G. Chen (CN)*
Optimization of Gompertz model with machine learning towards applicable and accurate simulation of anaerobic digestion

***M. Occhinegro**, I. Bortone, L. Alibardi, F. Todaro, M. Notarnicola (IT)*
From mechanistic to symbolic modelling in anaerobic processes

***E. Ngobeni**, C. Trois (ZA)*
Systems evaluation of organic waste collection pathways for waste-to-energy production in fresh produce markets

***X. Wang**, B. Yan, S. Zhou, Y. Ge, Z. Wang, X. Lu, G. Chen (CN)*
Coupling carbon conversion with nutrient circularity mitigates environmental trade-offs in crop-livestock waste valorization

***M. Eronen**, A-M. Tuomala, V. Puhakka (FI)*
Renewable energy nodes for climate change mitigation using food processing residues

SESSION B03 / / 23rd November 2026 16:45 -18:00
ANAEROBIC PROCESSES: EFFICIENCY AND OPTIMISATION
Chair / *Presidente*: TBD

***E. Lee**, P. Sokunthea, J. Shin, K.J. Min, K.Y. Park (KR)*
Process stability of food waste leachate anaerobic digestion against fog shock loading through sludge recirculation

***S. Nilsson Påledal**, E. Nordell, J. Moestedt (SE)*
Lessons learned from more than 25 years of laboratory- and full-scale anaerobic digestion: the role of iron chloride and trace elements in process stability

***H.J. Shin**, Y.B. Seo, Y.M. Yoon (KR)*
Effects of water potential induced by Na+, K+, Mg2+ and Ca2+ on anaerobic methane production and microbial community characteristics

SESSION B04 / / 24th November 2026 09:00 -10:15
SPECIFIC BIOMASS MANAGEMENT
Chair / *Presidente*: TBD

***D. Mulu Gebeyehu**, M. Mekuyie, C. Trois, A. Dell'Orto (ZA)*
Climate change resilience of smallholder farmers through food waste valorization into biofertilizer: a circular approach

***A.P.C. Ribeiro**, L.M.D.R.S. Martins, A.O. Figueiras (PT)*
From BSF exuviae to Chitosan: a sustainability perspective

***L.M.D.R.S. Martins**, A.P.C. Ribeiro, A.O. Figueiras (PT)*
Unlocking the potential of insect biomass waste: Chitin and Chitosan valorisation in the circular bioeconomy

***B.L. Short**, C. Palazón, C. Garrido Pérez, J.A. Perales Vargas-Machuca, M.D. Macías-Sánchez, J. Ruiz (ES)*
Winery wastewater valorisation through microalgae: nutrient removal and biomass production

SESSION B05 / / 24th November 2026 10:45 -12:00
HYDROGEN PRODUCTION AND VALORISATION
Chair / *Presidente*: TBD

***K.L. Mascarenhas**, S.T. Coelho, J. Romano Meneghini ()*
From wastewater to sustainable hydrogen: social acceptance and communication challenges for the energy transition

***A. Gutierrez-Gomez**, V. Garcilasso, M. dos Santos, K. Mascarenhas, J. Meneghini, S. Coelho ()*
Pathways for hydrogen production from municipal solid waste: potential assessment in Sao Paulo State, Brazil

***A. Trinca**, A. Giuliano, P. Garzone, R. Albergo, A. Caporusso, E. Viola, I. De Bari (IT)*
Green hydrogen-assisted glycerol valorization for advanced biofuels

SESSION B06 / / 24th November 2026 12:15 -13:30
PERSPECTIVES OF BIOGAS UTILISATION
Chair / *Presidente*: TBD

***I. Ålund**, S. Voorwalt (NO)*
Is biogas as green as we think? Methane leaks, LDAR campaigns and bio-CCS in the biogas value chain

***S. Alves Fonseca**, A. Barbosa-Póvoa, T. Rodrigues Pereira Ramos (PT)*
Integrated OFMSW-to-renewable methane pathways: conversion, emissions and logistics

***K. Kawai** (JP)*
Biomethane potential to substitute for grid-supplied gas in Japan in 2050

***A. Dell'Orto**, E. Ngobeni, C. Trois (ZA)*
An investigation into the prospective environmental and economic benefits of integrated biohydrogen and biomethane production from municipal organic waste in South Africa: insights from Cape Town and Durban

SESSION B07 / / 24th November 2026 15:00 -16:15
ENHANCED ENERGY RECOVERY FROM BIOLOGICAL PROCESSES
Chair / *Presidente*: TBD

M. Holden *(GB)*
From declining landfill asset to renewable energy hub: the potential role of ex-situ biomethanation in future landfill gas management

I. Rahmouni*, J. Wiechert, A. Nassour, M. Nelles (DE)*
Comparative assessment of innovative technologies for low-calorific landfill gas (LoCaGas) utilization

Md.T. Islam*, A. Huda, S. Ahmed (BD)*
From phytoremediation biomass to electricity: a circular resource recovery approach for faecal sludge treatment plants

C. Trois*, G. Gaogane, A. Dell'Orto, P. Sekoai (ZA)*
Otimising biohydrogen production from slaughterhouse waste via biochar-assisted dark fermentation

SESSION B08 / / 24th November 2026 16:45 -18:00
EDUCATION AND PUBLIC AWARENESS IN WASTE-TO-ENERGY
Chair / *Presidente*: TBD

G. De Feo *(IT)*
Waste-to-energy and systems thinking: the Greenopoli pedagogical approach

I. Grinfelde*, V. Grybauskiene, J. Pilecka-Ulcugaceva (LV)*
Education for sustainable development as a tool for building future competences in biomass, waste to energy and circular economy sectors

G. De Feo, ***G. Marmora****, A.A. Paruolo, A. Grosso (IT)*
The hidden role of waste-to-energy: a counterfactual assessment of the Acerra plant in Southern Italy

SESSION B09 / / 25th November 2026 09:00 -10:15
SPECIFIC CIRCULAR ECONOMY STREAMS
Chair / *Presidente*: TBD

***A. Bartl**, N. Depope (AT)*
Integrated biorefinery concept for blended textile waste: from enzymatic hydrolysis to ethanol and methanol production

***R. Visser** (NL)*
Carbon-fibers from cotton-rich post-consumer textile waste: Upcycling as an economically viable recycling option?

***N. Depope**, F. Quartinello, J. Egan, A. Bartl, C.B. Schimper (AT)*
Restex: closing the loop in textile waste recycling

***A. Boscolo**, L. Placentino, M. Placentino (IT)*
Industrial sorting techniques for the detection and separation of end-of-waste plastic products: from polymers to phthalates and additives

SESSION B10 / / 25th November 2026 10:45 -12:00
CIRCULAR VALORISATION OF INDUSTRIAL WASTE STREAMS
Chair / *Presidente*: TBD

***A.K. Avornyo**, S.W. Hasan, F. Banat, C.V. Chrysikopoulos (QA)*
In-situ CaCO?-templated structuring of low-cost graphene oxide-kaolin ceramic membranes for predictable fouling control in oily wastewater filtration

***G. Trancone**, M. Race, G. Policastro, M. Fabbricino (IT)*
Circular integration of dark fermentation and mineral waste valorization: calcium leaching from construction and demolition waste using bio-based effluents

*G. Dalla Santa, M. Noro, **G. Giacomello**, A. Maghssudipour, E. Buoso (IT)*
From waste heat and road pavements to local district heating: an integrated technical, socio-economic and regulatory framework for urban energy transition

SESSION B11 / / 25th November 2026 12:15 -13:30
RIFIUTI E SALUTE: PRESENTAZIONE LIBRO
Chair / *Presidente*: Raffaello Cossu, Margherita Ferrante (IT)

Italian Session

La relazione tra gestione dei rifiuti e salute pubblica è da tempo al centro delle preoccupazioni delle comunità che vivono vicino agli impianti di trattamento e smaltimento. Allo stesso tempo, una gestione razionale e sostenibile dei rifiuti è indispensabile per la tutela dell'ambiente e il recupero di risorse materiali ed energetiche. Il rapporto tra rifiuti e salute è stato oggetto di molti studi scientifici, spesso però limitati da approcci monodisciplinari o influenzati da interessi di parte. Da questa consapevolezza nasce il Comitato Interdisciplinare su Rifiuti e Salute (CIRS), un'iniziativa indipendente che promuove un confronto rigoroso e basato su evidenze verificabili.
Questo Rapporto, frutto di sette anni di lavoro e del contributo di oltre 200 esperti, offre una sintesi aggiornata delle conoscenze su rifiuti, tecnologie di gestione e possibili impatti, con l'obiettivo di fornire strumenti utili per scelte informate a tutela della salute e dell'ambiente.
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SESSION B12 / / 25th November 2026 15:00 -16:15
WORKSHOP - PFAS IN THERMAL TREATMENT SYSTEMS: CHALLENGES AND FUTURE DIRECTIONS
Chair / *Presidente*: Fatemeh Khodaparastan, Tarek Rashwan (UK)

Per- and polyfluoroalkyl substances (PFAS) have been key synthetic compounds used in many consumer and safety-critical products and – from food wrappers to fire-fighting foams. Thousands of unique compounds are now under the PFAS classification. PFAS contamination is insidious as current understanding now shows that pollution from these compounds poses severe environmental risks. Due to PFAS' toxicity, persistency, and mobility – small concentrations can transport widely in the environment and bioaccumulate in the food chain to adversely impact human and ecosystem health. There are now many treatment methods available that aim to capture PFAS to limit its mobility in the environment. As an example, activated carbon and ion exchange resins are commonly used to remove PFAS from drinking water. From another perspective, critical anesthetic gases such as isoflurane, desflurane, and sevoflurane have been widely used in medical applications; these gases are trapped in activated carbon after use for disposal. The used activated carbon and ion exchange resins, as well as other PFAS-contaminated materials (e.g., municipal solid wastes, sewage sludge, and hazardous wastes), necessitate active treatment.

Thermal treatment methods have shown strong promise in destroying PFAS at the appropriate conditions (e.g., peak temperatures and residence times). However, there are many research gaps regarding PFAS destruction in these thermal systems, and even small concentrations of untreated PFAS leftover from incomplete or partial destruction can pose long-lasting and challenging environmental risks for future generations. These PFAS treatment knowledge gaps must be solved to reliably ensure full PFAS destruction in thermal waste treatment systems. Furthermore, treatment method selection is shaped not only by technical effectiveness but also by regulatory frameworks, liability structures, and the application of the polluter-pays principle.

This workshop integrates technical and policy perspectives to explore how institutional frameworks influence PFAS treatment choices.

T. Rashwan, ***F. Khodaparastan****, F. Fredriksson, R. Aro, L. Yeung, M. Johansson (GB)*
Exploring challenges and future directions associated with PFAS-contaminated waste in thermal treatment systems

SESSION C01 / / 23rd November 2026 12:15 -13:30
LIFE CYCLE THINKING AND ASSESSMENT
Chair / *Presidente*: TBD

***H. Schindler**, L. Merfort, V. Lenz, S. Majer, D. Thrän (DE)*
Policies for sustainable forest bioenergy in the EU: the Renewable Energy Directive, the role of carbon pricing and implications for wood-cascading in the bioeconomy

***F. Ardolino**, F. Parrillo, M. Monaco, U. Arena (IT)*
Environmental assessment of energy and material recovery strategies for infectious healthcare waste

***M. Loaiza Agudelo**, F.M. Zúñiga Ortiz, E.A. Ariza Echeverri, J.W. Calderón Hernández (CO)*
Artificial Intelligence for the prediction of the energy potential of residual biomass in Colombia

***Y. Abera**, C. Trois (ZA)*
The WROSE model as an evidence-based decision-support tool for sustainable waste management planning and policy in South Africa

*M. Pasetto, **G. Giacomello**, F. Tabarin, R. Cimicata, M. Zaghet, B. Bora, M. Jamshidi (IT)*
Environmental assessment of asphalt mixtures containing recycled shingle production waste: a circular economy approach

SESSION C02 / / 23rd November 2026 15:00 -16:15
WORKSHOP - SUSTAINABLE ELECTRONICS: REUSE, RECYCLING, AND LCA I
Chair / *Presidente*: Karoline Owusu-Sekyere (DE)

Waste Electrical and Electronic Equipment (WEEE), or e-waste, is one of the world's fastest-growing waste streams, driven by rapid digital transformation and technological innovation. However, a large share of globally generated e-waste never enters formal collection and recycling systems and poses environmental burdens at the end of its life. Even when it is collected, current recycling technologies often fail to recover many valuable and critical raw materials, particularly those in complex microelectronic components, resulting in losses to slags or other residual waste streams. At the same time, the manufacturing of new electronic devices, especially microelectronic components, is globally rising and highly resource- and energy-intensive, contributing to climate change, resource depletion, and water scarcity.
This workshop explores how principles of early-stage sustainability decisions for emerging electronics can contribute to resource efficiency and climate change mitigation by shifting the focus from end-of-life approaches toward predictive circular design strategies. We will investigate how sustainability can be systematically embedded across device architecture, and component design to enable recycling, less resource use and higher levels of circularity throughout the electronics value chain. A further challenge lies in the early stages of innovation, where environmental impacts are overlooked during the design and development of novel materials and electronic components. We are assessing how Life Cycle Assessment (LCA) and sustainability considerations from the beginning of innovation can help avoid unsustainable material development and design choices associated with energy-intensive and solvent-heavy production pathways and enable more sustainable technology development before commercialization.
The workshop presents research from the "Responsible Electronics in the Climate Change Era" (REC2) Cluster of Excellence at the TU Dresden and highlights innovative approaches to advancing circularity and sustainability in emerging electronics.
Participants will explore:
- Integrating recycling into device design through predictive approaches that enable more sustainable electronics across their life cycle.
- Developing circular economy frameworks for design-for-reuse, with a focus on future electronic material flows and component-level reuse.
- Establishing reuse factors and materials libraries for emerging materials and micro- and nanoelectronics, supporting sustainability assessment and decision-making during early-stage technology development.
By connecting resource management, circular economy strategies, and sustainable electronics innovation, the workshop aims to foster interdisciplinary discussion on how responsible innovation can reduce environmental impacts while improving resource efficiency across the electronics value chain.

Agenda - Part 1:

- *C. Dornack (DE)*
  Introduction to the workshop objectives and the challenges of e-waste, circularity, and climate impacts in the electronics sector and the REC2 Cluster of Excellence

- *R. Maletz (DE)*
  Enabling circularity in the electronics industry - State of the art and perspectives

- *L. Dahlmann (DE)*
  From reactive to predictive recycling: identifying environmental hotspots in the End-of-Life treatment of waste printed circuit boards

This session continues in the next one.

SESSION C03 / / 23rd November 2026 16:45 -18:00
WORKSHOP - SUSTAINABLE ELECTRONICS: REUSE, RECYCLING, AND LCA II
Chair / *Presidente*: Karoline Owusu-Sekyere (DE)

This session continues from the previous one.

Waste Electrical and Electronic Equipment (WEEE), or e-waste, is one of the world's fastest-growing waste streams, driven by rapid digital transformation and technological innovation. However, a large share of globally generated e-waste never enters formal collection and recycling systems and poses environmental burdens at the end of its life. Even when it is collected, current recycling technologies often fail to recover many valuable and critical raw materials, particularly those in complex microelectronic components, resulting in losses to slags or other residual waste streams. At the same time, the manufacturing of new electronic devices, especially microelectronic components, is globally rising and highly resource- and energy-intensive, contributing to climate change, resource depletion, and water scarcity.
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- Integrating recycling into device design through predictive approaches that enable more sustainable electronics across their life cycle.
- Developing circular economy frameworks for design-for-reuse, with a focus on future electronic material flows and component-level reuse.
- Establishing reuse factors and materials libraries for emerging materials and micro- and nanoelectronics, supporting sustainability assessment and decision-making during early-stage technology development.
By connecting resource management, circular economy strategies, and sustainable electronics innovation, the workshop aims to foster interdisciplinary discussion on how responsible innovation can reduce environmental impacts while improving resource efficiency across the electronics value chain.

Agenda - Part 2:

- *K. Owusu-Sekyere (DE)*
  Frameworks for component-level reuse and design-for-reuse concepts addressing future electronic material flows

- *H. Shankar Yeram (DE)*
  Closing the loop on automotive microelectronics: current challenges, regulatory drivers, and circular pathways for End-of-Life chips

- Summary of key insights and discussion, identification of future research priorities, and opportunities for collaboration across academia, industry, and policy

SESSION C04 / / 24th November 2026 09:00 -10:15
WORKSHOP - CARBON, NUTRIENT, AND ENERGY RECOVERY PATHWAYS I
Chair / *Presidente*: Annett Pollex (DE)

Biomass and waste conversion can generate more than energy: thermochemical processes such as pyrolysis provide biochar and heat energy, while a wide range of biomass and organic waste streams can be valorized for nutrient recovery and agricultural use. Biochar offers a particularly promising link between energy and material recovery, combining heat energy utilization options e.g. for district heatingn with carbon sequestration and use cases as soil amendment.
Biofertilizers are increasingly gaining attention as resilient bioeconomy approaches. Produced from locally available biomass residues, and organic waste streams, they can help to close nutrient cycles, reduce resource dependency, and restore soil fertility. In particular, they can counteract soil degradation caused by continuous nutrient extraction and declining soil organic carbon, while supporting integrated soil fertility management and food security.
When combined with biochar, the resulting biochar-based organic fertilizers can contribute to reduced soil acidification, limited nutrient leaching and enhanced long-term carbon sequestration. Carbon financing mechanisms that enable smallholder revenue-sharing, such as the Artisan C-Sink certification, can further improve economic viability in particular in the Global South.
The workshop will discuss challenges, enabling conditions, and successful implementation examples of integrated biomass- and waste-based resource recovery systems. It will explore how different biomass and waste streams, conversion technologies, and end-use pathways can be combined to maximize resource recovery and create locally appropriate circular systems.

This session continues in the next one.

SESSION C05 / / 24th November 2026 10:45 -12:00
WORKSHOP - CARBON, NUTRIENT, AND ENERGY RECOVERY PATHWAYS II
Chair / *Presidente*: Annett Pollex (DE)

This session continues from the previous one.

Biomass and waste conversion can generate more than energy: thermochemical processes such as pyrolysis provide biochar and heat energy, while a wide range of biomass and organic waste streams can be valorized for nutrient recovery and agricultural use. Biochar offers a particularly promising link between energy and material recovery, combining heat energy utilization options e.g. for district heatingn with carbon sequestration and use cases as soil amendment.
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SESSION C06 / / 24th November 2026 12:15 -13:30
SUSTAINABLE AVIATION FUELS (SAFS)
Chair / *Presidente*: TBD

W.P. Clarke (AU)
The economic viability of bioenergy

A. Saeed, M.A. Qyyum, A. Riaz, S. Al-Saadi, F. Al-Jahwari, ***A.H. Al-Muhtaseb*** *(OM)*
Decision-oriented benchmarking of sustainable aviation fuel pathways: harmonized cost, boundary-aware carbon intensity, and deployment readiness

M.A. Rasheed*, M. Materazzi (GB)*
Techno-economic and environmental assessment of sustainable aviation fuel production from waste with system integrations

I. Gökalp *()*
Zero-emission sustainable aviation fuel (SAF) production from high-moisture organic waste

SESSION C07 / / 24th November 2026 15:00 -16:15
WORKSHOP - IWWG THERMAL TREATMENTS TASK GROUP SANDPIT I
Chair / *Presidente*: Lidia Lombardi (IT)

A modern integrated solid waste management system should maximize resource recovery, given that, in a life-cycle approach, energy or fuel/chemicals recovery from waste allows decreasing consumption of fossil fuels and overall emissions from all current conversion systems. Advanced thermal treatment systems can contribute to these goals, and among them, gasification stands out as a particularly promising approach, enabling efficient energy and material recovery, while other emerging technologies offer complementary opportunities to enhance performance and sustainability. Despite these potentials, significant challenges remain across commercial/economic, policy/regulatory, technological, and environmental/sustainability dimensions.
This “sandpit” style workshop will bring together researchers, industry experts, and stakeholders to explore these advanced thermal treatment approaches, analyse challenges and lessons from recent project successes and failures.
The aim is to collaboratively produce a summary report and distilled document that highlights the current state of advanced thermal waste treatment and identifies key future trends.

This session continues in the next one.

SESSION C08 / / 24th November 2026 16:45 -18:00
WORKSHOP - IWWG THERMAL TREATMENTS TASK GROUP SANDPIT II
Chair / *Presidente*: Lidia Lombardi (IT)

This session continues from the previous one.

A modern integrated solid waste management system should maximize resource recovery, given that, in a life-cycle approach, energy or fuel/chemicals recovery from waste allows decreasing consumption of fossil fuels and overall emissions from all current conversion systems. Advanced thermal treatment systems can contribute to these goals, and among them, gasification stands out as a particularly promising approach, enabling efficient energy and material recovery, while other emerging technologies offer complementary opportunities to enhance performance and sustainability. Despite these potentials, significant challenges remain across commercial/economic, policy/regulatory, technological, and environmental/sustainability dimensions.
This “sandpit” style workshop will bring together researchers, industry experts, and stakeholders to explore these advanced thermal treatment approaches, analyse challenges and lessons from recent project successes and failures.
The aim is to collaboratively produce a summary report and distilled document that highlights the current state of advanced thermal waste treatment and identifies key future trends.

SESSION C09 / / 25th November 2026 09:00 -10:15
WORKSHOP - IEA BIOENERGY TASK 33: BIOFUELS AND BIOCHEMICALS I
Chair / *Presidente*: Joakim Lundgren (SE)

The workshop - organised by IEA Bioenergy Task 33 - will explore the potential of gasification as a pathway for producing biofuels and biochemicals from biomass and other renewable carbon-containing feedstocks. It will cover gasification technologies, syngas production and conditioning, and downstream catalytic and biochemical conversion routes to fuels, chemicals and other bio-based products.
Particular attention will be given to technological development, feedstock flexibility, process integration, sustainability and the potential contribution of gasification-based pathways to the defossilisation of the transport, energy and chemical sectors. The workshop will also provide an opportunity to discuss current challenges, research needs and opportunities for further collaboration.

Agenda - Part 1:

- *J. Hrbek - BOKU University (AT)*
  IEA Bioenergy Task 33 – Gasification of biogenic and waste feedstocks for a sustainable future

- *B. Vreugdenhil - TNO (NL)*
  TNOs Perspective on SAF production

- *D. Barisano - ENEA (IT)*
  Production of H2-rich syngas from the gasification of biomass and biogenic fraction of waste: in-bed implementations in a BFB reactor

- *B. Yan - Tianjin University (CN)*
  Anaerobic fermentation integrated gasification process and high-efficiency tar removal technology towards green methanol synthesis

This session continues in the next one.

SESSION C10 / / 25th November 2026 10:45 -12:00
WORKSHOP - IEA BIOENERGY TASK 33: BIOFUELS AND BIOCHEMICALS II
Chair / *Presidente*: Jitka Hrbek (AT)

This session continues from the previous one.

The workshop - organised by IEA Bioenergy Task 33 - will explore the potential of gasification as a pathway for producing biofuels and biochemicals from biomass and other renewable carbon-containing feedstocks. It will cover gasification technologies, syngas production and conditioning, and downstream catalytic and biochemical conversion routes to fuels, chemicals and other bio-based products.
Particular attention will be given to technological development, feedstock flexibility, process integration, sustainability and the potential contribution of gasification-based pathways to the defossilisation of the transport, energy and chemical sectors. The workshop will also provide an opportunity to discuss current challenges, research needs and opportunities for further collaboration.

Agenda - Part 2:

- *U. Pasqual Laverdura - ENEA (IT)*
  Feedstock flexibility and process integration in sorption-enhanced gasification: from winery waste to methanol and power

- *S. Fleck - Karlsruhe Institute for Technology (DE)*
  Influence of process conditions on the conversion of plastic waste based pyrolysis oil under entrained flow conditions

- *J. Lundgren - Luleå University of Technology (SE)*
  Biomass to biofuels or negative emissions

- Discussion table

SESSION C11 / / 25th November 2026 12:15 -13:30
NATIONAL CASE STUDIES
Chair / *Presidente*: TBD

***C. Trois**, Y. Abera, M. Coetzee, A. Dell'Orto, M. Mariani, C. Nell, F. Schenck (ZA)*
Assessing the renewable energy and carbon reduction potential of vine waste valorisation in the South African wine industry using the WROSE model

***E. Ali**, S. Narra, J. Bio-Oti, K. Yoatse (DE)*
Does taxing pollution reduce biogenic methane emissions from the waste sector? Quasi-experimental evidence from Ghana's Sanitation and Pollution Levy

***E.M.S. Guerreiro**, A.F. Simões (BR)*
Municipal solid waste management in Brazil: structural barriers to energy recovery and governance challenges

***E.M.S. Guerreiro**, E.S. Braga (BR)*
Integrating waste management into environmental planning for oil spill contingency: lessons from major Brazilian oil spill events

SESSION PP / / 23rd November 2026 09:00 -18:00
POSTER SESSION
Chair / *Presidente*: None

Poster presentations will be displayed **in digital format** in a dedicated hall throughout the conference, with opportunities to discuss them with the authors, depending on their availability.

***E.J. Cho**, H. Park, H.-J. Bae (KR)*
Integrated valorization of waste paper in a sustainable biorefinery platform

***D. Ciolkosz**, J. Ali, M. Hile, M. Steiman (US)*
Farm scale testing of biochar in digesters

***B. Doria**, C. Pastore, V. Locaputo, M. Lacalamita, E. Mesto, F. Raganati, A. Marzocchella, L. di Bitonto (IT)*
Cu-TiO?/LHLs photocatalyst from sewage sludge for solar hydrogen production and wastewater remediation

***S. Frienberga**, A. Patersone, J. Pilecka-Ulcugaceva, I. Grinfelde (LV)*
Forecasts of waste volume and flow dynamics in Latvia in the context of EU waste management policy

***D. Mulu Gebeyehu**, M. Mekuyie, C. Trois, A. Dell'Orto (ZA)*
Exploring organic municipal waste valorization through Black Soldier Fly larvae and assessing the nutritional quality of the produced larvae for animal feed

***F. Gramigni**, L. Armilli, A. Bosetti, D. Cucchetti, A. Poletto, I. Rapone, V. Rodighiero, T. Pasini (IT)*
Experimental study of dark fermentation using deoiled cakes as feedstock

***J. Grave**, J. Pilecka–Ulcugaceva, I. Grinfelde (LV)*
PFOS and PFOA behaviour in two contrasting river basins of Latvia: seasonal dynamics and environmental controls

***T. Hatagami**, Y. Kaizu, K. Furuhashi (JP)*
Environmental and agricultural benefits of field application of gasification biochar as a fertilizer

***M.H.T. Huynh**, S. Jang, H.-J. Bae (KR)*
Feedstock-dependent enhancement of lignocellulosic saccharification by a GH10 Xylanase-secreting Trichoderma reesei enzyme system

***T. Kawaguchi**, Y. Nishiyama, S. Kosai, S. Kashiwakura, H. Ikuta, A. Tokuhara, A. Tamaki, Y. Nakajima, Y. Yamakata, E. Yamasue (JP)*
Life cycle resource use of biomass- and waste-derived SAF in Japan

***S.Y. Kim**, J.S. Nam, Y.M. Yoon. C.H. Kim (KR)*
Effects of various biomass-derived biochars on methane production kinetics and anaerobic digestion performance of food wastewater

*J.M. Choi, **C.Y. Lee** (KR)*
Anaerobic co-digestion of pig manure and food waste leachate: performance, operational stability, and the hydrogenotrophic-to-acetoclastic ratio as a complementary indicator

***A. Magdziarz**, A. Mlonak-Medrala, M. Granollers Mesa, M. Sajdak, C. Quan, N. Gao, J. Wang (PL)*
Marine plastic pollution: a global threat to life below water and human well-being

*A. Guzzini, **M. Pellegrini**, J. Suzzi (IT)*

From Waste-To-Energy to Waste-To-X: a new circular approach to convert municipal solid waste into liquid CO2, water and computing power for IT infrastructures

***J. Pilecka-Ulcugaceva**, I. Grinfelde (LV)*
Using urban snow as a passive environmental monitoring tool to identify potential household waste burning emissions: a case study from Jelgava, Latvia

*W. Rasaq, J. Vasco, M. Rahman, A. Bialowiec, T. Causer, S. Opalinski, D. DeVallance, D. Troy, L. Nunes, **D. Ciolkosz** (US)*
Development of a BioSTEAM-based process model for biochar production from lignocellulosic biomass: preliminary mass, energy, and economic assessment

***A.P. Ribeiro**, M. Piñero, A.T. Brandão (PT)*
Mechanophotocatalysis with porphyrins: solid-state degradation of solid pollutants

***Y.B. Seo**, H.J. Shin, Y.M. Yoon (KR)*
Effects of water potential reduction induced by Cations (Na+, K+, Mg2+, and Ca2+) on anaerobic digestion performance across different inocula

***J. Shin**, K.J. Min, E. Lee, K.Y. Park (KR)*
Ammonia recovery from anaerobic digestate using integrated electrochemical treatment and membrane contactor

***H. Watanabe**, S. Kosai, S. Kashiwakura, K. Kashimura, T. Miyata, E. Yamasue (JP)*
Recovery of carbon fibers and hydrogen production characteristics via microwave pyrolysis of CFRP using a FeAl?O? catalyst

***F. Zimbardi**, U. Calice, N. Cerone, V. Valerio (IT)*
Electrochemical remediation of lignocellulosic waste for low-energy green hydrogen generation

*M.C. Oliveira, I.R.F.S. Alves, E.P. Santiago, C.M.S. Cassar, I.D. Bassin, N.B.C. Santos, C. Sambusiti, **J.P. Bassin** (BR)*
Food waste composition governs the shape, not only the magnitude, of methane conversion in co-digestion with green waste

*M.C. Oliveira, I.R.F.S. Alves, E.P. Santiago, I.D. Bassin, A.C. Coelho, H.L. Silva, N.B.C. Santos, C. Sambusiti, **J.P. Bassin** (BR)*
Beyond conventional stability thresholds: alkalinity as an early-warning indicator in a food and green waste co-digester

*J.C. Mendonça, F.M.S. Silva, J.P. Bassin, M.L.E. Gutarra, **I.D. Bassin** (BR)*
Comparison of enzymatic pretreatment and direct enzyme addition for anaerobic co-digestion of waste activated sludge and food waste

***I.R.F.S. Alves**, M.C. Oliveira, E.P. Santiago, I.D. Bassin, A.C. Coelho, H.L. Silva, N.B.C. Santos, C. Sambusiti, J.P. Bassin (BR)*
Food waste and green waste co-digestion: effects on process stability and methane production

*G.P.V. Heidelmann, C.P. Pereira, J.P. Bassin, C.S. Guimarães, **I.D. Bassin** (BR)*
Thermo-alkaline pretreatment of green waste for enhanced methane production

***N. Pierro**, A. Giuliano, E. Viola, I. De Bari (IT)*
From the biomass atlas to an advanced decision-support system: mapping residual and waste biomass and interoperable architecture for territorial energy planning in Italy